

AMENDMENTS TO THE CLAIMS

This listing of claims will replace all prior versions and listings of claims in the application:

LISTING OF CLAIMS:

1. (Currently Amended) A liquid ejection head, comprising:
 - a liquid chamber, which stores liquid therein;
 - a nozzle orifice, adapted to eject a liquid droplet therefrom;
 - a pressure generating portion, provided in ~~an~~ a liquid channel communicating with the liquid chamber and the nozzle orifice;
 - an elastic plate, which defines a part of the pressure generating portion,
 - a piezoelectric vibrator, comprising:
 - a first common electrode, provided on a surface of the ~~vibration plate~~ elastic plate which is opposite to a surface facing the pressure generating portion, and electrically connected to a common potential;
 - a first piezoelectric layer, provided on the first common electrode;
 - a drive electrode, provided on the first piezoelectric layer, and electrically connected to a signal source for supplying a drive signal;
 - a second piezoelectric layer, provided so as to cover the drive electrode; and
 - a second common electrode, provided on the second piezoelectric layer, and electrically connected to the common potential, the piezoelectric vibrator being deformed in accordance with the drive signal supplied to the drive electrode, so that the elastic plate is

deformed to vary a volume of the pressure generating portion, thereby ejecting the liquid droplet from the nozzle orifice; ~~and,~~

a liquid supply port, arranged between the liquid chamber and the pressure generating portion to serve as an orifice; and

a pressure chamber which is a part of the pressure generating portion;

wherein ~~an inductance of the nozzle orifice~~ a value of a length of the nozzle orifice divided by a cross section of the nozzle orifice and ~~an inductance of the liquid supply port~~ a value of a length of the liquid supply port divided by a cross section of the liquid supply port are greater than ~~an inductance of the pressure generating portion~~ a value of a length of the pressure chamber divided by a cross section of the pressure chamber.

2. (Previously Presented) The liquid ejection head as set forth in claim 1, wherein a thickness of the first piezoelectric layer and a thickness of the second piezoelectric layer are set to 10 μm or less.

3. (Previously Presented) The liquid ejection head as set forth in claim 1, wherein the inductance of the nozzle orifice and the inductance of the liquid supply port are each set so as to be more than double the inductance of the pressure generating portion.

4. (Currently Amended) The liquid ejection head as set forth in claim 1, wherein the pressure generating portion comprises:

a pressure chamber, a volume of which is varied by the deformation of the elastic plate which defines a part of the pressure chamber;

a nozzle communication port, communicating with a first longitudinal end of the pressure chamber and the nozzle orifice; and

a supply-side communication port, communicating with a second longitudinal end of the pressure chamber and the liquid supply port; and

wherein a longitudinal dimension of the pressure chamber is set to 1.1 mm or less.

5. (Previously Presented) The liquid ejection head as set forth in claim 1, wherein an amount of the deformation of the piezoelectric vibrator is set to a value of 0.16 μm or more.

6. (Previously Presented) The liquid ejection head as set forth in claim 1, wherein a compliance of the piezoelectric vibrator is set to a compliance of the liquid or less.

7. (Previously Presented) The liquid ejection head as set forth in claim 1, wherein a volume of the liquid droplet ejected from the nozzle orifice is set to 6 pL or more, and an ejection frequency of the liquid droplet is set to 50 kHz or higher.

8. (Previously Presented) The liquid ejection head as set forth in claim 1, wherein a volume of the liquid droplet ejected from the nozzle orifice is set to 3 pL or less, and an ejection frequency of the liquid droplet is set to 30 kHz or higher.

9. (Previously Presented) The liquid ejection head as set forth in claim 1, wherein a natural period of the pressure generating portion is set to $7\ \mu\text{s}$ or less.

10. (New) A liquid ejection head, comprising:

- a liquid chamber, which stores liquid therein;
- a nozzle orifice, adapted to eject a liquid droplet therefrom;
- a pressure generating portion, provided in a liquid channel communicating with the liquid chamber and the nozzle orifice;
- an elastic plate, which defines a part of the pressure generating portion;
- a piezoelectric vibrator, comprising:
 - a first common electrode, provided on a surface of the elastic plate which is opposite to a surface facing the pressure generating portion, and electrically connected to a common potential;
 - a first piezoelectric layer, provided on the first common electrode;
 - a drive electrode, provided on the first piezoelectric layer, and electrically connected to a signal source for supplying a drive signal;
 - a second piezoelectric layer, provided so as to cover the drive electrode; and
 - a second common electrode, provided on the second piezoelectric layer, and electrically connected to the common potential, the piezoelectric vibrator being deformed in accordance with the drive signal supplied to the drive electrode, so that the elastic plate is

deformed to vary a volume of the pressure generating portion, thereby ejecting the liquid droplet from the nozzle orifice;

a liquid supply port, arranged between the liquid chamber and the pressure generating portion to serve as an orifice; and

a pressure chamber, which is a part of the pressure generating portion;

wherein an inner wall of the pressure chamber defining a longitudinal end thereof partly covers the liquid supply port.

11. (New) A liquid ejection head, comprising:

a liquid chamber, which stores liquid therein;

a nozzle orifice, adapted to eject a liquid droplet therefrom;

a pressure generating portion, provided in a liquid channel communicating with the liquid chamber and the nozzle orifice;

an elastic plate, which defines a part of the pressure generating portion;

a piezoelectric vibrator, comprising:

a first common electrode, provided on a surface of the elastic plate which is opposite to a surface facing the pressure generating portion, and electrically connected to a common potential;

a first piezoelectric layer, provided on the first common electrode;

a drive electrode, provided on the first piezoelectric layer, and electrically connected to a signal source for supplying a drive signal;

a second piezoelectric layer, provided so as to cover the drive electrode; and

a second common electrode, provided on the second piezoelectric layer, and electrically connected to the common potential, the piezoelectric vibrator being deformed in accordance with the drive signal supplied to the drive electrode, so that the elastic plate is deformed to vary a volume of the pressure generating portion, thereby ejecting the liquid droplet from the nozzle orifice;

a liquid supply port, arranged between the liquid chamber and the pressure generating portion to serve as an orifice; and

a pressure chamber, which is a part of the pressure generating portion;

wherein an inner wall of the pressure chamber defining a longitudinal end thereof partly covers the nozzle orifice.

12. (New) A liquid ejection head, comprising:

a liquid chamber, which stores liquid therein;

a nozzle orifice, adapted to eject a liquid droplet therefrom;

a pressure generating portion, provided in a liquid channel communicating with the liquid chamber and the nozzle orifice;

an elastic plate, which defines a part of the pressure generating portion;

a piezoelectric vibrator, comprising:

a first electrode, provided on a surface of the elastic plate which is opposite to a surface facing the pressure generating portion, and electrically connected to a common potential;

a piezoelectric layer, provided on the first electrode; and

a second electrode, provided on the piezoelectric layer, and electrically connected to a signal source for supplying a drive signal;

a liquid supply port, arranged between the liquid chamber and the pressure generating portion to serve as an orifice; and

a pressure chamber, which is a part of the pressure generating portion;

wherein a value of a length of the nozzle orifice divided by a cross section of the nozzle orifice and a value of a length of the liquid supply port divided by a cross section of the liquid supply port are greater than a value of a length of the pressure chamber divided by a cross section of the pressure chamber.